MegaRAID® SAS 9280-16i4e RAID Controller

Quick Installation Guide

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Revision History

Version and Date	Description of Changes
46563-00 Rev. A, June 2010	Initial release of document.

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Quick Installation Guide

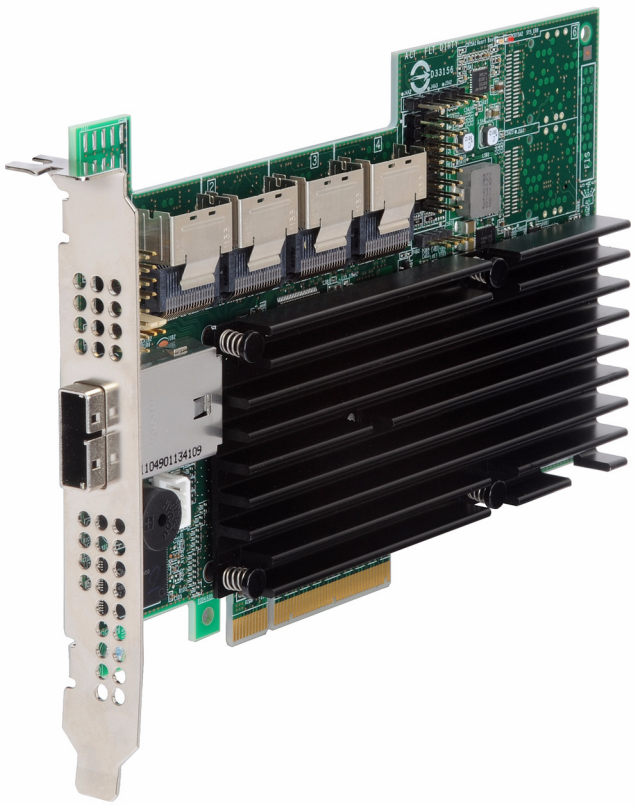
MegaRAID SAS 9280-16i4e RAID Controller

The MegaRAID® SAS 9280-16i4e RAID controller is a PCI-Express, standard-height, half-length RAID controller that offers a 6 Gb/s transfer rate. It controls 16 internal SAS/SATA ports through four SFF-8087 x4 internal connectors and four external SAS/SATA ports through one SFF-8088 x4 external connectors.

Thank you for purchasing the LSI™ MegaRAID 6Gb/s SAS 9280-16i4e RAID controller. Your MegaRAID controller provides reliability, high performance, and fault-tolerant drive subsystem management. Before you install your RAID controller, please take a few minutes to read this quick installation guide. If you need more information about any topic covered in this guide, refer to the related documents on your *MegaRAID Universal Software Suite* CD.

Figure 1 shows the MegaRAID SAS 9280-16i4e RAID controller.

Figure 1: MegaRAID SAS 9280-16i4e RAID Controller



NOTE: Record your controller serial number in a safe location in case you need to contact LSI.

NOTE: SATA II is the only type of SATA supported by this RAID controller.

You can connect your MegaRAID SAS 9280-16i4e RAID controller remotely to the LSI intelligent Battery Backup Unit 07 (LSIiBBU07) and the LSI intelligent Battery Backup Unit 08 (LSIiBBU08). For more information about these batteries, refer to the *MegaRAID iBBU07 Intelligent Battery Backup Unit Quick Installation Guide* and the *MegaRAID iBBU08 Intelligent Battery Backup Unit Quick Installation Guide* on the *MegaRAID Universal Software Suite* CD.

Controller Installation

CAUTION Back up your data before changing your system configuration. Otherwise, you might lose data.

1. **Unpack the RAID Controller**

   Unpack the RAID controller in a static-free environment. Remove it from the antistatic bag, and inspect it for damage. If the RAID controller appears to be damaged, or if the *MegaRAID Universal Software Suite* CD is missing, contact LSI or your MegaRAID OEM support representative.

   The CD contains utility programs, device drivers for various operating systems, and the following documentation:

   - *MegaRAID 6Gb/s SAS RAID Controllers User's Guide*
   - *MegaRAID SAS Software User's Guide*
   - *MegaRAID SAS Device Driver Installation User's Guide*
   - *Battery Backup Units for MegaRAID SAS RAID Controllers User's Guide*
   - *MegaRAID iBBU07 Intelligent Battery Backup Unit Quick Installation Guide*
   - *MegaRAID iBBU08 Intelligent Battery Backup Unit Quick Installation Guide*
   - Software license agreement

2. **Prepare the Computer**

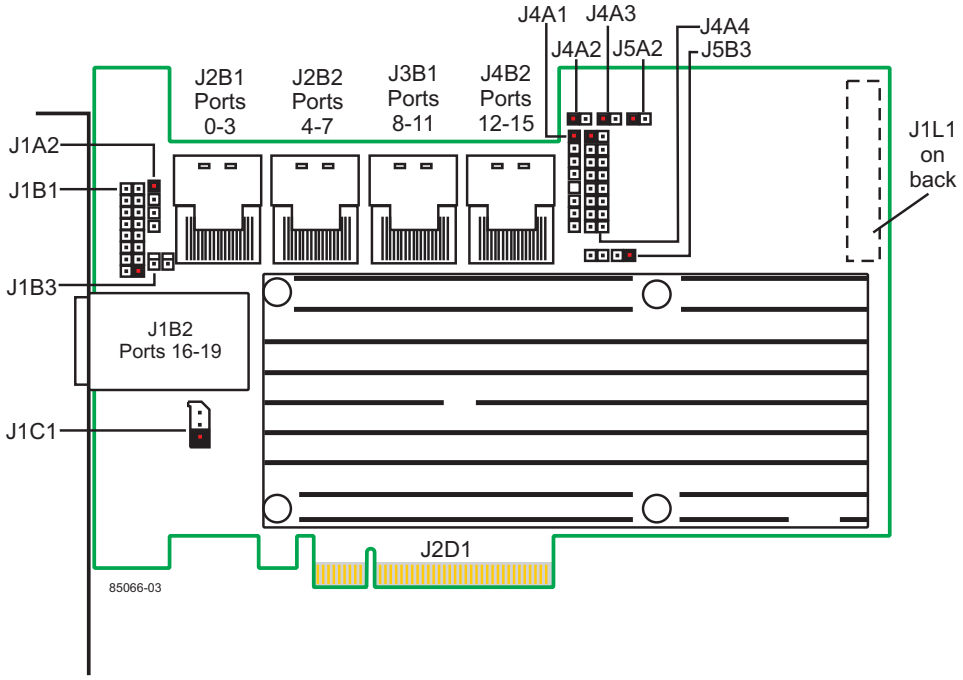
   Turn off the computer, and unplug the power cords from the rear of the power supply. Remove the cover from the computer.

CAUTION Before you install the RAID controller, make sure that the computer is disconnected from the power and from any networks.

3. **Review the Jumpers and the Connectors**

   Figure 2 shows the location of the jumpers and the connectors on the RAID controller. The jumpers are set at the factory, and you usually do not need to change them.

Figure 2: Layout of the SAS 9280-16i4e RAID Controller



NOTE: Pin 1 on the headers and connectors is highlighted in black and red in Figure 2.

Table 1 describes the jumpers and the connectors on the RAID controller.

Table 1: Jumpers and Connectors

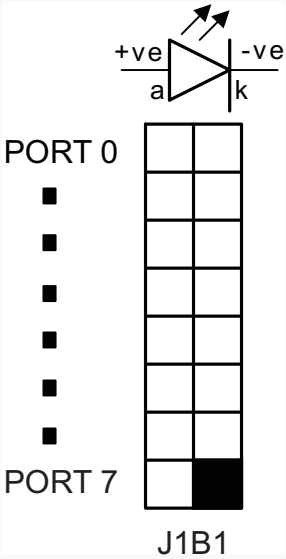
Jumper/ Connector	Type	Description
J1A2	Universal Asynchronous Receiver/Transmitter (UART) for the Expander	4-pin connector Reserved for LSI use.
J1B1	LED Locate and Fault Indication header Ports 0-3 Ports 4-7 	2x8-pin connector Connects to an LED that indicates whether a drive is in a fault condition. There is one LED per port. When lit, each LED indicates the corresponding drive has failed or is in the unconfigured-bad state. The LEDs function in a direct-attach configuration (there are no SAS expanders). Direct attach is defined as a maximum of one drive connected directly to each port. **NOTE:** This header is used for RAID controllers with internal SAS ports only.
J1B2	x4 SAS Ports 16-19 external connector	SFF-8088 x4 external mini SAS connector Connects the controller by cable to a SAS/SATA backplane or an expander.
J1B3	Advanced Software Hardware Key header	2-pin header Enables support for selected advanced features, which include recovery, CacheCade, FastPath, and SafeStore disk encryption.
J1C1	IPMI-style I^2C connector	3-pin connector Supports SES (SCSI enclosure services) over I^2C through an internal I^2C backplane cable.
J1L1	Remote Battery Backup connector (on the backside of the controller)	20-pin connector Connects the LSIiBBU07 intelligent Battery Backup Unit or the LSIiBBU08 intelligent Battery Backup Unit remotely to the RAID controller.
J2B1	x4 SAS Ports 0-3 internal connector	SFF-8087 x4 internal mini SAS connector Connects the controller by cable to SAS drives or SATA 2 drives.

Table 1: Jumpers and Connectors (Continued)

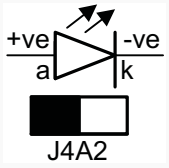
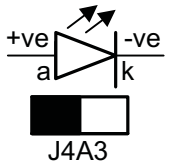
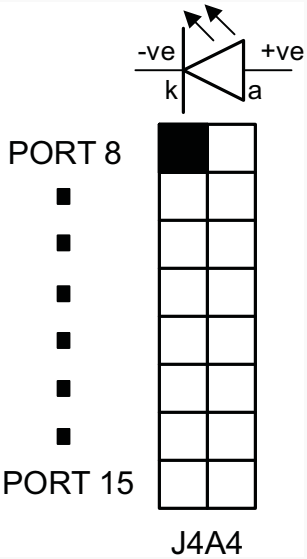
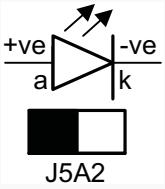
Jumper/ Connector	Type	Description
J2B2	x4 SAS Ports 4-7 internal connector	SFF-8087 x4 internal mini SAS connector Connects the controller by cable to SAS drives or SATA 2 drives.
J2D1	Standard edge card connector	The RAID controller interfaces with the host system though a standard edge card. This interface provides power to the board and an I^2C interface connected to the I^2C bus for IPMI.
J3B1	x4 SAS Ports 8-11 internal connector	SFF-8087 x4 internal mini SAS connector Connects the controller by cable to SAS drives or SATA 2 drives.
J4A1	Module CPLD	1x8-pin connector Reserved for LSI use.
J4A2	Activity LED header 	2-pin connector Connects to an LED that indicates activity on the drives connected to the controller.
J4A3	Global drive fault LED header 	2-pin connector Connects to an LED that indicates whether a drive is in a fault condition.

Table 1: Jumpers and Connectors (Continued)

Jumper/ Connector	Type	Description
J4A4	LED Locate and Fault Indication header Ports 8-11 Ports 12-15 	2x8-pin header Connects to an LED that indicates whether a drive is in a fault condition. There is one LED per port. When lit, each LED indicates the corresponding drive has failed or is in the Unconfigured-Bad state. The LEDs function in a direct-attach configuration (there are no SAS expanders). Direct attach is defined as a maximum of one drive connected directly to each port. **NOTE:** This header is used for RAID controllers with internal SAS ports only.
J4B2	x4 SAS Ports 12-15 internal connector	SFF-8087 x4 internal mini SAS connector Connects the controller by cable to SAS drives or SATA 2 drives.
J5A2	Write pending LED header 	2-pin connector Connects to an LED that indicates when the data in the cache has yet to be written to the storage devices. Used when the write-back feature is enabled.
J5B3	Universal Asynchronous Receiver/Transmitter (UART) debugging	4-pin connector Reserved for LSI use.

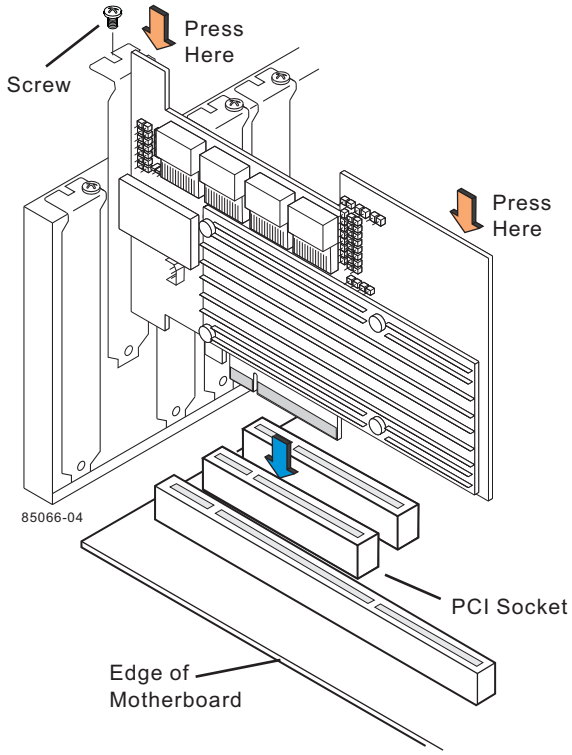
4. Install the RAID Controller

Insert the controller into a PCI Express slot on the motherboard, as shown in Figure 3. Press down gently, but firmly, to seat the card correctly in the slot. Secure the RAID controller to the computer chassis with the bracket screw.

NOTE: This is a PCI Express x8 card and it can operate in x8 or x16 slots. However, some PCIe slots support only PCIe graphics cards; if a RAID controller is installed, it will not function.

NOTE: Refer to the guide for your motherboard for information about the PCI Express slot.

Figure 3: Installing the MegaRAID SAS 9280-16i4e RAID Controller



5. **Configure and Install the SAS Devices, SATA II Devices, or Both in the Host Computer Case**

   Refer to the documentation for the devices for any preinstallation configuration requirements.

6. **Connect the RAID Controller to the SAS Devices, SATA II Devices, or Both in the Host Computer Case**

   Use SAS cables to connect the RAID controller to SAS devices, SATA II devices, or both. See Figure 2 to view the connector locations.

NOTE: Refer to the *MegaRAID 6Gb/s SAS RAID Controllers User's Guide* on the *MegaRAID Universal Software Suite* CD for detailed information about the SAS cables.

7. **Turn on the Power to the Computer**

Reinstall the computer cover, and reconnect the power cords. Turn on the power to the computer. Make sure that the power is turned on to the SAS devices and the SATA II devices before or at the same time that the power to the host computer is turned on. If the power is turned on to the computer before it is turned on to the devices, the computer might not recognize the devices.

The firmware takes several seconds to initialize. During this time, the controller scans the ports.

8. **Run the WebBIOS Configuration Utility**

   Run the WebBIOS Configuration Utility to configure the groups and the virtual drives. When the message `Press <Ctrl><H> for WebBIOS` appears on the screen, immediately press CTRL+H to run the utility.

NOTE: Refer to the *MegaRAID SAS Software User's Guide* for detailed steps on configuring groups and virtual drives.

9. **Install the Operating System Driver**

   The controller can operate under various operating systems, but you must install the software drivers first.

   The *MegaRAID Universal Software Suite* CD includes the software drivers for the supported operating systems, along with documentation. You can view the supported operating systems and download the latest drivers for RAID controllers from the LSI web site at: http://www.lsi.com/cm/DownloadSearch.do. Access the download center, and follow the steps to download the driver.

   Refer to the *MegaRAID SAS Device Driver Installation User's Guide* on the *MegaRAID Universal Software Suite* CD for more information about installing the driver. Be sure to use the latest service packs that are provided by the operating system manufacturer and to review the `readme` file that accompanies the driver.

Supported RAID Levels

This RAID controller supports drive groups using the following RAID levels:

- **RAID 0 (data striping):** Data is striped across all drives in the group, enabling very fast data throughput. There is no data redundancy. All data is lost if any drive fails.
- **RAID 1 (drive mirroring):** Data is written simultaneously to both drives in the drive group, providing complete data redundancy if one drive fails. RAID 1 supports an even number of drives from 2 to 32 in a single span.
- **RAID 5 (drive striping with distributed parity):** Data is striped across all drives in the group. Part of the capacity of each drive stores parity information that reconstructs data if a drive fails. RAID 5 provides good data throughput for applications with high read request rates.
- **RAID 6 (drive striping with distributed parity across two drives):** Data is striped across all drives in the group and two parity drives are used to provide protection against the failure of up to two drives. In each row of data blocks, two sets of parity data are stored.

- **RAID 00 (data striping across RAID 0 drive groups):** RAID 00 is a spanned drive group that creates a striped set from a series of RAID 0 drive groups.
- **RAID 10 (RAID 1 and RAID 0 in spanned groups):** RAID 10 uses mirrored pairs of drives to provide complete data redundancy. RAID 10 provides high data throughput rates.
- **RAID 50 (RAID 5 and RAID 0 in spanned groups):** RAID 50 uses both parity and drive striping across multiple drives to provide complete data redundancy. RAID 50 provides high data throughput rates.
- **RAID 60 (RAID 6 and RAID 0 in spanned groups):** RAID 60 uses both distributed parity across two parity drives and drive striping across multiple drives to provide complete data redundancy and high fault tolerance.

NOTE: Refer to the *MegaRAID SAS Software User's Guide* on the *MegaRAID Universal Software Suite* CD for more information about RAID levels

Technical Support

For assistance in installing, configuring, or running the SAS 9280-16i4e RAID controller, contact an LSI Technical Support representative.

Click the following link to access the LSI Technical Support page for storage and board support:

http://www.lsi.com/support/storage/tech_support/index.html

From this page, you can send an email or call Technical Support, or submit a new service request and view its status.

E-mail:

http://www.lsi.com/support/support_form.html

Phone Support:

http://www.lsi.com/support/storage/phone_tech_support/index.html

1-800-633-4545 (North America)

00-800-5745-6442 (International)

NOTE: The international toll-free number does not require country-specific access codes.

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